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[54] **SINGLE LAYER INTEGRATED METAL PROCESS FOR HIGH ELECTRON MOBILITY TRANSISTOR (HEMT) AND PSEUDOMORPHIC HIGH ELECTRON MOBILITY TRANSISTOR (PHEMT)**

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[52] **U.S. Cl.** **438/172**; 438/949; 438/423

[58] **Field of Search** 437/40–41, 912; 257/194; 438/172, 949, 423

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[57] **ABSTRACT**

A method for fabricating a periodic table group III–IV HEMT/pHEMT field-effect transistor device. The disclosed fabrication arrangement uses a single metalization for ohmic and Schottky barrier contacts, employs selective etching with a permanent etch stop layer, employs a non-alloyed ohmic contact semiconductor layer and includes a permanent non-photosensitive secondary mask element. The invention includes provisions for both an all optical lithographic process and a combined optical and electron beam lithographic process These concepts are combined to provide a field-effect transistor device of reduced fabrication cost, increased dimensional accuracy and state of the art electrical performance.

23 Claims, 8 Drawing Sheets